URETEROSIGMOIDOSTOMY*

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URETEROSIGMOIDOSTOMY may be an especially delicate subject in New York, where I believe the operation is infrequently performed at the present time. Nonetheless, it is my belief that ureterosigmoidostomy, historically one of the oldest safe and tolerable methods of urinary diversion when the urinary bladder cannot be used, has been neglected in recent years. As stated in a fairly recent publication, "We believe that the operation of ureterosigmoidostomy is due for a renascence."[1] Ureterosigmoidostomy was probably first used about 1852 by Simon for exstrophy of the urinary bladder.[2] Many techniques have been described, and I shall not attempt to trace the history of the operation here because it has been described elsewhere.[1]

The operation has been severely criticized for a number of reasons. Perhaps the most important is that most patients who have it develop pyelonephritis at some time or another.[3]

Most recently we find a highly critical article from the Squier Urological Clinic and Babies Hospital at Columbia, by Macfarlane, Lattimer, and Hensle[4] in which they said,

> Patients with ureterosigmoid urinary diversions always have some anal leakage of a malodorous mixture of feces and urine, especially at night or when passing gas. They obtain limited continence only by consciously keeping their buttocks tensed together. Their unusually high elimination frequency weds them to a bathroom for the rest of their lives.
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> The universal prevalence of this truly severe burden of liquid fecal incontinence, which a patient is asked to bear after ureterosigmoidostomy diversion, is not well recognized and should be clearly revealed to the patient before a choice of procedure is made.

They do, indeed, make an important observation. We have seen *some* patients (immature children) with this problem, but we must take exception to their statement that these patients *always* have this complaint. Our

*The Nineteenth Ferdinand C. Valentine Lecture of the Section on Urology of the New York Academy of Medicine, presented March 19, 1980.

experience is contrary. It is a rare complaint, and most patients learn to live very successfully with ureterocolonic diversion.

Another recognized potential hazard of ureterosigmoidostomy is cancer of the colon, which may develop as a late complication. The most recent description of this is by Spence et al.[5] They say:

> Two cases of cancer of the colon have occurred recently in our series of 38 patients with exstrophy of the bladder treated by ureterosigmoidostomy. Twenty-six and 14 years elapsed between the original operation and the diagnosis of malignancy. Since 1929 the literature contains reports of 55 patients who have developed bowel neoplasms as a late complication of this form of diversion. The operation was performed for exstrophy in 35 of these, in whom the resulting tumour at the anastomotic site was malignant in 28 and benign in 7 patients. The shortest interval between ureterosigmoidostomy and recognition of the growth was 10 years with a mean latent period of 25 years. The aetiology remains uncertain but it is clear that long-term survivors after ureterosigmoidostomy should have diagnostic large bowel studies included in the follow-up.

Guy Leadbetter has also commented on this. He estimated that the chance that a patient with ureterosigmoidostomy will develop a malignancy of the large bowel was 100 times greater than that of the normal population.

Despite these criticisms, I believe that ureterosigmoidostomy is a useful and practical procedure and one that I would prefer to have myself if I could no longer have the use of my urinary bladder.

What are the options? One is cutaneous diversion. Most urologists realize that, except for emergency procedures and special cases in which the ureters are tremendously dilated, ureteroileocutaneous anastomosis (Bricker's operation) has superseded any direct diversion of the urine to the skin, either from the ureters or the renal pelves or from the kidney by nephrostomy.

There are some recent observations on long-term ureteroileo- and ureterocolonic cutaneous diversions in children.[6,7] The results are not encouraging. Indeed, when compared with long-range results of ureterosigmoidostomy,[8] they are no better and may be worse. Dunn et al. summarized it as follows:

> Sixty-seven children undergoing urinary diversion by ileal conduit tolerated this procedure well. The initial results were most satisfying, but late complications occurred in 55 children (82%), and this is a cause for concern. Even when the surgical complications were avoided, it seemed important to consider carefully the psychological problems that these children with ileal loop diversion could develop as they advanced into adult life.[6]

Elder et al. said:

> The results of colonic conduit urinary diversion have been reviewed in 41 children with an average follow-up of 13.2 years. There was a high incidence of stomal stenosis (61.5%), ureterocolic stenosis (22%), ureteric reflux (58%) and upper tract deterioration (48.4%). Comparison with results of ileal conduit diversion in children show no advantage in the use of colon.[7]

In my own experience, most patients who have ureterosigmoidostomy live as well as or better than those with cutaneous diversion. Certainly, the *quality* of life differs. They enjoy a nearly normal life and body image. This is particularly true of younger people, who hate the body image of a bag hanging on the abdomen, as is required in cutaneous urinary diversion.

In the illustrated lecture, I presented a number of examples of young and vigorous men, women, and especially children who appreciated the quality of their lives with ureterosigmoidostomy. They did not want cutaneous urinary diversion.

One special recent patient comes to mind: a business executive, a vigorous athletic man in his 40s, who had ureterosigmoidostomy because of a leiomyoma of the prostate. He tells me that he is a skier, a swimmer and a runner, that he is not limited in any way, and that as long as he has sense enough to empty his bowel of urine at least every three hours, he has no problem whatsoever. He volunteered that he felt that none of his associates where he works were aware of his condition. This is not likely to be the case with a patient who is wearing a bag on the abdomen as a result of cutaneous urinary diversion.

TECHNIQUE[15]

Most frequently, I have used a technique described in 1953.[9] With this procedure the ureters are transplanted through the open bowel in a manner very similar to the ureterovesical anastomosis described by Politano and Leadbetter. The important ingredient is a long submucosal tunnel. The advantage is visual anastomosis of a spatulated ureter under complete control, with the ability to employ stenting ureteral catheters. An important technical point, in my view, is to place the anastomosis very low in the sigmoid, below the sacral promontory. When this is achieved, the rectosigmoid seems, in fact, to act as a bladder. This operation has been satisfactory in our experience. There is no proof that it is in any way superior in results to the operations described by Leadbetter[10] and independently by Weyrauch and Young.[11]

We believe that after a long submucosal tunnel the important thing is to make the anastomosis as low as possible in the colon, if possible, at the level where the ureters would normally enter the bladder. We also believe that the anastomosis should be spatulated. In recent years we have usually sewn the ureters together like the wings of a butterfly, as described in our original article about the open transcolonic technique.[9]

All patients who have ureterosigmoidostomy must be watched closely for problems associated with pyelonephritis and hyperchloremic acidosis. We are very sensitive to and aware of the complications of ureterosigmoidostomy.[12] All these patients are maintained on a low sodium chloride diet to reduce their chloride intake and avoid "chloride acidosis." They must be given extra base to make up for this. That is accomplished by giving them sodium potassium citrate (sodium citrate 5 gm., potassium citrate 5 gm./100 ml. That is a 10% solution). They usually take about 30 ml. of this at least once and sometimes twice a day.

In the early postoperative period they receive antibacterial drugs, and in the long-range some of them take such a drug as Septra® or Bactrim® on a once-a-day basis. (Stamey, who once condemned ureterosigmoidostomy,[14] has told me that he believes that with this antibacterial suppression and with adequate sodium and potassium supplement, ureterosigmoidostomy can and should continue to be an important alternate way of dealing with urinary diversion.)

In my opinion, ureterosigmoidostomy is not only due for a renascence but should be employed more often than it is. Whenever I deal with this problem, I offer patients the choice between cutaneous diversion and ureterosigmoidostomy. I try to tell them the good and bad features of each.

If I had to live without an urinary bladder, with some kind of urinary diversion, I believe I should choose ureterosigmoidostomy over any of the other options, even though I know the perils and problems involved.

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